

## REMARKS

5 The Examiner has noted that a Claim number 45 was  
inadvertently omitted and has kindly renumbered Claims 46-63 as  
Claims 45-62. Applicants apologize for this error.

10 The Examiner has restricted the claims for examination  
purposes. Applicants affirm the June 2, 2004 telephone selection  
of Group 1, Claims 1-33, for prosecution at this time. Such  
restriction does not alter inventorship of the application, and  
no request for change in inventorship is required thereby.

15 The Examiner has objected to the Abstract as being in excess  
of 150 words, as required in MPEP § 608.01(b). As required,  
Applicants have reduced the length of the Abstract text, as shown  
in page 2, to 148 words as measured by Word Count in Microsoft  
Word.

20 Claims 4-7, 19-22, 26, 27, and 32 have been rejected under  
35 USC 112, second paragraph, as being indefinite for failing to  
point out and distinctly claim the subject matter which applicant  
regards as the invention.

Regarding Claim 4, the Examiner holds that the recitation in  
step c) of "attaching oxygen bubbles to said second bitumen  
material" is vague and indefinite as to where the oxygen bubbles  
come from and how they attach to the second bitumen material.

25 Applicants respond that Claim 4 is amended to include the  
elements "adding hydrogen peroxide to said second slurry;  
d) decomposing a portion of said hydrogen peroxide to form second  
oxygen bubbles attached to said second bitumen material", which  
treatment is essentially a repeat of the treatment provided to  
30 the first slurry and is described fully at page 20 lines 10-18.  
As to how the oxygen bubbles attach to the bitumen material,  
Applicants submit that full understanding of the mechanism of  
attachment is not required to support patentability; however, the  
description at page 16 lines 14-24 supports the claim language:  
35 "In a first separation stage 113 for each tar sand grain, the

nascent gas phase immediately swells as oxygen bubbles 112 form between the bitumen envelope 106 and the particulate core 104, disrupting the structure of the tar sand grain and causing the bitumen envelope to become detached from the mineral particulate.

5 In a second separation stage 115 for the slurry as a whole, the oxygen bubbles 112 remain attached preferentially to the bitumen globules 114, giving the globules great buoyancy such that they rapidly migrate upwards 116 in the slurry, wherein the apparent viscosity is rapidly decreasing from decomposition of the tar sand grains." Further, as the material of Claim 5 is now  
10 incorporated into Claim 4, Claim 5 is cancelled in its entirety.

Regarding Claim 6, antecedent "first separation tank" is now provided in amended Claim 2.

Regarding Claims 19 and 20, each claim is amended to depend  
15 from Claim 2 which contains antecedence (step c) for "said recovering step."

Regarding Claim 21, the clarifying term "primary" is added to "water phase"; further, Claim 21 depends from Claim 20 which now depends from Claim 2 wherein the antecedent "primary water  
20 phase" appears.

Regarding Claim 22, the term "sand" is changed to "mineral particulates separated from said bitumen material" which finds antecedence in Claim 1 step f).

Regarding Claim 26, the claim is cancelled in its entirety.

25 Regarding Claim 27, "substrate" is changed to "particulates" which finds antecedence in Claim 1.

Regarding Claim 32, the Examiner holds that the recitation of "collecting gaseous hydrocarbons generated in said method" is vague and indefinite as to (how? where? sic) the method generates  
30 gaseous hydrocarbons."

Applicants respond that the claim is fully supported at page 22 lines 13-21: "The present process may also yield gaseous hydrocarbons which are desirably collected for at least environmental reasons, and which may be present in sufficient  
35 quantity to have economic significance. Accordingly, a vacuum

pump 70 is connected via vacuum lines 72 to a headspace 74 in the oxidizing vessel, a headspace 76 beneath cover 59 of the separator tank, and a headspace 78 in storage tank 56. The collected vapors 80 may be burned off to the atmosphere or may be  
5 directed for combustion in water heating system 68 or may be otherwise used." Accordingly, no amendment to Claim 32 is presented.

Claims 1-3, 10, 12-16, 23-28, 32, and 33 have been rejected  
10 under 35 USC 102(b) as being anticipated by Canadian Published Patent Application No 2,177,018. This rejection is respectfully traversed.

The Examiner holds that the reference "discloses a method of separating oil and bitumen from sand comprising mixing and  
15 agitating (i.e. shearing) said sand containing oil and bitumen with water in a tank for some time to form an aqueous slurry; tempering said aqueous slurry to about 45°C, the tempering of the slurry inherently taking at least 8 minutes; adding hydrogen peroxide to the slurry and agitating (i.e. shearing) the slurry  
20 for some time; the peroxide serves as a catalyst and initiates a vigorous reaction by inherently forming oxygen bubbles between said bitumen and said sand by decomposing a portion of said hydrogen peroxide therein; the vigorous reaction separates the aqueous slurry into an upper froth layer containing oil and  
25 bitumen, a middle clean water layer, and a lower clean sand layer; skimming the upper froth layer containing oil and bitumen; removing the middle clean water layer; and removing the lower clean sand layer."

Applicants respond that some of the shortcomings of this  
30 reference are addressed in their Specification at page 6 line 23 as follows: "Canadian Patent Application No. 2,177,018 ("018"), laid open for public inspection November 22, 1997, and abandoned December 21, 2000, discloses a batch process for separating oil and bitumen from sand by mixing sand and water in a tank to form  
35 an aqueous slurry; adding a water solution of hydrogen peroxide

to the aqueous slurry; agitating the slurry containing the hydrogen peroxide; skimming an upper froth layer containing oil and bitumen; and removing a lower clean sand layer and a middle clean water layer from the tank. The disclosed process is relatively slow and low in capacity. Mechanical agitation of the slurry is relatively low, being provided specifically and only by injection of gas bubbles through an air injection assembly. Use of a mechanical rotary mixer, for example, is not suggested.

Hydrogen peroxide is taught as "a catalyst initiating a vigorous reaction." For overall speed, the process relies on the rate at which the hydrogen peroxide attacks the tar sand granules, separating the slurry into "an upper froth layer, a middle clean water layer, a lower clean sand layer, and a clay layer." The disclosed process does not teach or suggest that vigorous mechanical agitation and/or substantially elevating the temperature above 45°C may accelerate the process or increase the overall yield."

Applicants must emphasize that their claimed process is patentably distinct from the cited process in the following respects:

1. The cited prior art Application is intended to make one believe that the process would be useful in extracting bitumen from tar sands, but in fact such is not the case. Indeed, both the title of the application and the Claim 1 preamble recite only "separating oil and bitumen from sand," not from tar sands. Such separation is not equivalent to decomposing and separating tar sands. The disclosed prior art test conditions do not employ tar sands or tar ores; see prior art page 5 line 19 through page 6 line 3. There are no results or claims provided for actual tar sands. The reported tests use only simulated tar sands made by mixing sand, oil, and bitumen together. As one of ordinary skill in the art of bitumen recovery from tar sands knows, however, **naturally occurring tar sands grains are far more difficult to break open and separate than such an artificial mixture.** Indeed, the cited prior art process, without using any hydrogen peroxide,

reduces the oil and bitumen contamination of the sand from 7.2% to 0.31%, a 96% recovery! (page 5 lines 23-29). Such could not possibly be the result with actual tar sands! Hence, this is a naively simple cleaning process that makes no recognition of the desirability or need of subjecting real tar sand grains to intensive shearing to open them to peroxide attack. Thus, one can make no judgment as to the possible efficacy of this prior art process when used with naturally-occurring, notoriously resistant tar sands and ores.

2. The cited process discloses only generic "agitation" and not "shearing" agitation and relies solely on bubbling gas through the slurry to provide such generic agitation. There is no mention or suggestion to make the agitation sufficiently vigorous to cause fracturing of the grains, nor to employ a high-speed linear mixer as disclosed by Applicants to do so. Intense shearing agitation sufficient to tear open the bitumen envelope of tar sand grains to provide ready entrance of hydrogen peroxide is disclosed by Applicants at page 13 line 5 through page 15 line 6, and defines the meaning of "shearing" as used by Applicants in Claims 1, 12, and 13. This level of mechanical shearing greatly accelerates the rate of separation over what may be possible with the prior art process. To further distinguish, Claim 1 is amended to recite that said shearing is produced by "a rotary mixer apparatus."

3. The tempering period of 8 minutes which the Examiner holds in the cited prior art is a period of shearing is not, as has just been shown, a period of shearing but only a period of tempering. Even extended periods of mild agitation by bubbling air through the slurry, no matter how effervescently, cannot duplicate Applicants' claimed conditions of intense shearing by a high-speed rotary mixing apparatus; thus, the cited process does not anticipate Applicants' claimed process.

4. Applicants' preferred process, as claimed in Claim 11, is operated at 80°C, whereas the cited process is operated at a

maximum of 45°C. Temperature elevation to 80°C serves to significantly accelerate the process and is not disclosed or suggested by the cited reference.

For these reasons, the rejections under 35 USC § 102(b) are  
5 not supported and should be withdrawn.

Claims 4-9 and 29-31 have been rejected under 35 USC § 103(a) as being unpatentable over Canadian Published Patent Application No. 2,177,018. This rejection is respectfully  
10 traversed.

Regarding Claims 4-7, the Examiner holds that the cited reference fails to disclose further treating the removed sand layer but considers that it would have been obvious to one having ordinary skill in the art to have further treated the sand layer  
15 containing oil and bitumen the same way it was treated the first time. The Examiner holds similarly with respect to Claims 8 and 9 and to Claims 29-31.

Applicants respond that the Examiner, by citing only dependent claims, implicitly rejects Claim 1 as well under  
20 §103(a). But as has been shown above, amended Claim 1 is patentably distinct from the prior art cited; hence, the elements cited in these rejections in combination with Claim 1 are also patentably distinct. Therefore, these rejections are not supported and should be withdrawn.

25 Claim 11 has been rejected under 35 USC § 103(a) as being unpatentable over Canadian Published Patent Application No. 2,177,018 in view of Losack (US 5,368,411). This rejection is respectfully traversed.

The Examiner holds that the Canadian Publication discloses  
30 all elements of the claim except for tempering the aqueous slurry to about 80°C, and that Losack discloses to do so in a process for cleaning contaminated soil by adding hydrogen peroxide to an aqueous slurry of the soil and heating to about 80°C.

Applicants respond that Losack is directed to a process for

cleaning soil by providing conditions and including additives to foster the growth of micro-organisms which consume the soil contaminants, e.g., Claim 1, steps g and h: "(g) admixing the low contaminant soil with water and an activating agent for  
5 contaminant-degrading soil-indigenous microorganisms, the agent being capable of generating H.sub.2 O.sub.2 in solution; (h) allowing the microorganisms to interact with the aqueous mixture comprising the microorganism activating agent under conditions effective to substantially degrade contaminant remaining  
10 therein;" Hydrogen peroxide is only one of several cited additives.

Applicants submit that this process is entirely different from their claimed process, in that this process requires establishing conditions conducive to the growth and activity of  
15 micro-organisms, a requirement not present in Applicants' process. **Therefore, the thermal requirements are unrelated, even though both processes may coincidentally function well at about 80°C. It would not have been obvious to one having ordinary skill in the art to have tempered the inorganic aqueous slurry of**  
20 **the Canadian disclosure to about 80°C as taught by Losack, since it would not have been obvious to use microbe-optimal conditions to operate a non-microbial inorganic process.**

For these reasons, the rejection of Claim 11 under 35 USC § 103(a) is not supported and should be withdrawn.

25 Claims 17-22 have been rejected under 35 USC § 103(a) as being unpatentable over Canadian Published Patent Application No. 2,177,018 in view of Luft et al. (US 5,762,809). This rejection is respectfully traversed.

30 The Examiner holds that the Canadian Publication discloses all elements of the claim except for pressurizing the slurry to a gauge pressure of 1 to 5 atmospheres, and that Luft et al. discloses a method of cleaning a medium contaminated with organic constituents which includes adding water to the soil to form an

aqueous slurry and adding hydrogen peroxide to the aqueous slurry while pressurizing the slurry at a pressure range of approximately 2 to 19 gauge pressure. The Examiner holds it would be obvious to one of ordinary skill in the art to  
5 pressurize the process taught by the Canadian Publication to an elevated pressure in view of Luft et al.

Applicants respond that Claims 17 and 18 depend from Claim 1 which has been amended to be patentably distinct from the cited Canadian prior art; hence, the elements cited in these  
10 rejections in combination with Claim 1 are also patentably distinct. Claims 19 and 20 are amended to depend from Claim 2 which depends from Claim 1, and Claims 21 and 22 depend from Claim 20. Therefore, these rejections are not supported and should be withdrawn.

15 Having responded to each and every objection and rejection, and having amended their claims, Applicants respectfully request early reconsideration of the application and speedy allowance of all remaining claims.

20 Respectfully submitted,



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